Site Engineering Report

Heck Residence
57 Greenleaf Avenue
Darien, Connecticut

Prepared for:

Cynthia Heck
57 Greenleaf Avenue
Darien, CT 06820

Date Prepared:

April, 2021

Prepared by:
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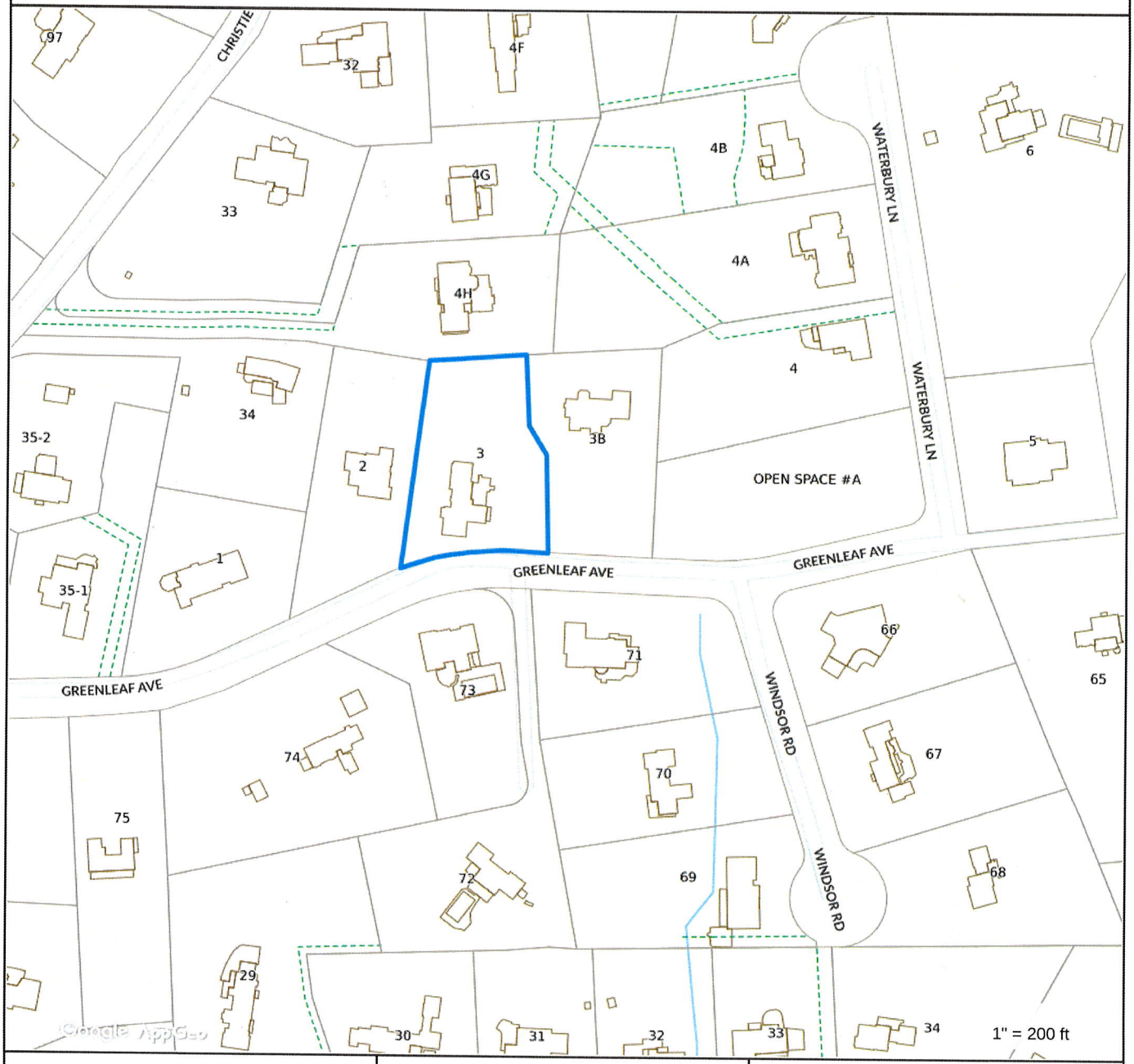
Town of Darien, CT

April 21, 2021

57 Greenleaf Avenue



Property Information

Property ID	04161
Location	57 GREENLEAF AVENUE
Owner	HECK CYNTHIA S

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Darien, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 3/15/2021
Data updated 3/11/2021

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

Introduction

This report has been prepared to present technical information in support of the construction of a pool house, pool and patios. Other proposed activity associated with this construction will be regrading and the installation of a stormwater management system. The property is located on the north side of Greenleaf Avenue in the R-1 Residence zone of Darien.

Existing Site Conditions

The property has a total lot area of 45,572± square feet or 1.0003± acres. The property is fully developed with the original house constructed in 1921 with a renovation completed in 2003 according to the assessor's card. The access to the property is via paved driveway from Greenleaf Avenue located parallel to the westerly property line.

The property is bordered by residential properties on three sides and Greenleaf Avenue to the south.

The parcel slopes mildly from west to east. The property consists of manicured lawn around the existing house, a small wooded area east and north of the edge of the lawn up to the property line. There are mature trees along the property boundaries and throughout the existing landscape.

The property was checked for wetlands and flagged by Aleksandra Moch on December 15, 2020 and field located by William W. Seymour & Associates, PC on January 12, 2021 and placed on the survey map. Wetlands were located along the easterly property line. Please see the appendix for the soils report.

Project Description

The proposal for this site consists of constructing a pool house, pool and patio areas related to the pool. Other work associated with this project will include site grading associated with the pool, pool house, the patios and the installation of a subsurface stormwater management system to handle the increase in impervious areas.

Stormwater Management

Based on the existing topography the runoff from this portion of the site typically drains from west to east. In developing the pre-development hydrology we used the existing conditions of the property consisting of a lawn area within the area of the proposed pool, pool house and patios.

Developed Site Runoff Characteristics

Development of the site will include the construction of a pool house, pool and patio areas. The analysis that was conducted on this site was to compare the pre-development conditions which consist of the existing conditions within the area of the pool, pool house and patios and compare it to the post-development conditions which will consist of the pool house roof area, pool and pool patio areas. The goal for the project is to manage the

runoff so that post-development peak rate of runoff will be equal to or less than the pre-development peak rate of runoff.

It is proposed to collect the runoff from the pool house roof area and the pool patio areas and convey the runoff to the proposed subsurface detention system where the runoff will be metered out to control the increase in runoff from the new development. There will be two subsurface detention systems. One will be on the north side of the proposed pool to collect the northern half of the pool house and the northern patio and the other stormwater management system will be on the south side of the proposed pool to collect the southern half of the pool house and the southern patio. Outflow from the surface detention systems will be equal to or less than pre-development flows for all design storms analyzed. (Please see the chart below for a summary of our findings.)

The methodology used to determine the peak rate of runoff was TR-20 computer model by HydroCAD. The 2, 10, 25 and 50 year, 24-hour design storms were used for the analysis of this property. We calculated the runoff for the whole site to determine the peak rate of runoff from the site. We looked at the pre-development conditions and then compared it to the post-development conditions.

Summary:

	2 Year Design Storm (cfs)	10 Year Design Storm (cfs)	25 Year Design Storm (cfs)	50 Year Design Storm (cfs)
Pre Development	.15	.29	36	.42
Post Development	.05	.22	.27	.37

Based on our findings the post-development peak rate of runoff from the proposed site plan will be less than or equal to pre-development conditions for all design storms analyzed.

Site Utilities

Sanitary Sewer

The existing residence is connected to the sanitary sewer. The proposed pool house will also be connected to the sanitary sewer via the existing house sewer connection.

Water

The site is connected to the municipal water main located in Greenleaf Avenue.

Sedimentation & Erosion Control Narrative

Reference is made to the Sedimentation and Erosion Control Plan drawing, which, along with this text is included in the report, part of the Sedimentation and Erosion Control Plan for this project. All erosion controls are to follow the 2002 CT Guideline for Soil

Erosion and Sediment Control.

Sedimentation and erosion controls for the lot will consist of silt fence placed on the down gradient side of all cut and fill areas and the installation of anti-tracking pads at the entrance of the construction access to the pool house and pool. Sedimentation and erosion controls shown on the plan are specific to this property.

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Appendix A:

Hydrology Calculations

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Appendix B:

Water Quality Volume Calculations

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Water Quality Volume (WQV) Calculations

Heck Residence
57 Greenleaf Avenue
Darien, Connecticut
Dated: 04/21/21

Water Quality Volume Calculations

Water Quality Volume (WQV) = ((1") (R) (A)) / 12
Where:
A = total area in square feet
R = 0.05 + 0.009 (I)
I = percent impervious cover

Proposed Site Sub Catchment # 2 & 3: Available Storage = 82 cu-ft @ elev 99.2±
A = 1,512 sf (house roof area, patio, driveway, lawn)
I = 966/1,512 = .639= 63.9%

R = 0.05 + 0.009 (63.9%)
R = 0.625

WQV = ((1") (R) (A)) / 12
WQV = ((1") (0.625) (1,512 sf)) / 12
WQV = 79 cu-ft (required)

Proposed Site Sub Catchment #4 & 5 Available Storage = 82 cu-ft @ elev 92.5 ±
A = 1,545 sf (house roof area)
I = 999/1,545 = .647 = 64.7%

R = 0.05 + 0.009 (64.7%)
R = 0.632

WQV = ((1") (R) (A)) / 12
WQV = ((1") (0.632) (1,545 sf)) / 12
WQV = 81.3 cu-ft (required)

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Appendix C:

Web Soils

DiVesta Civil Engineering, LLC

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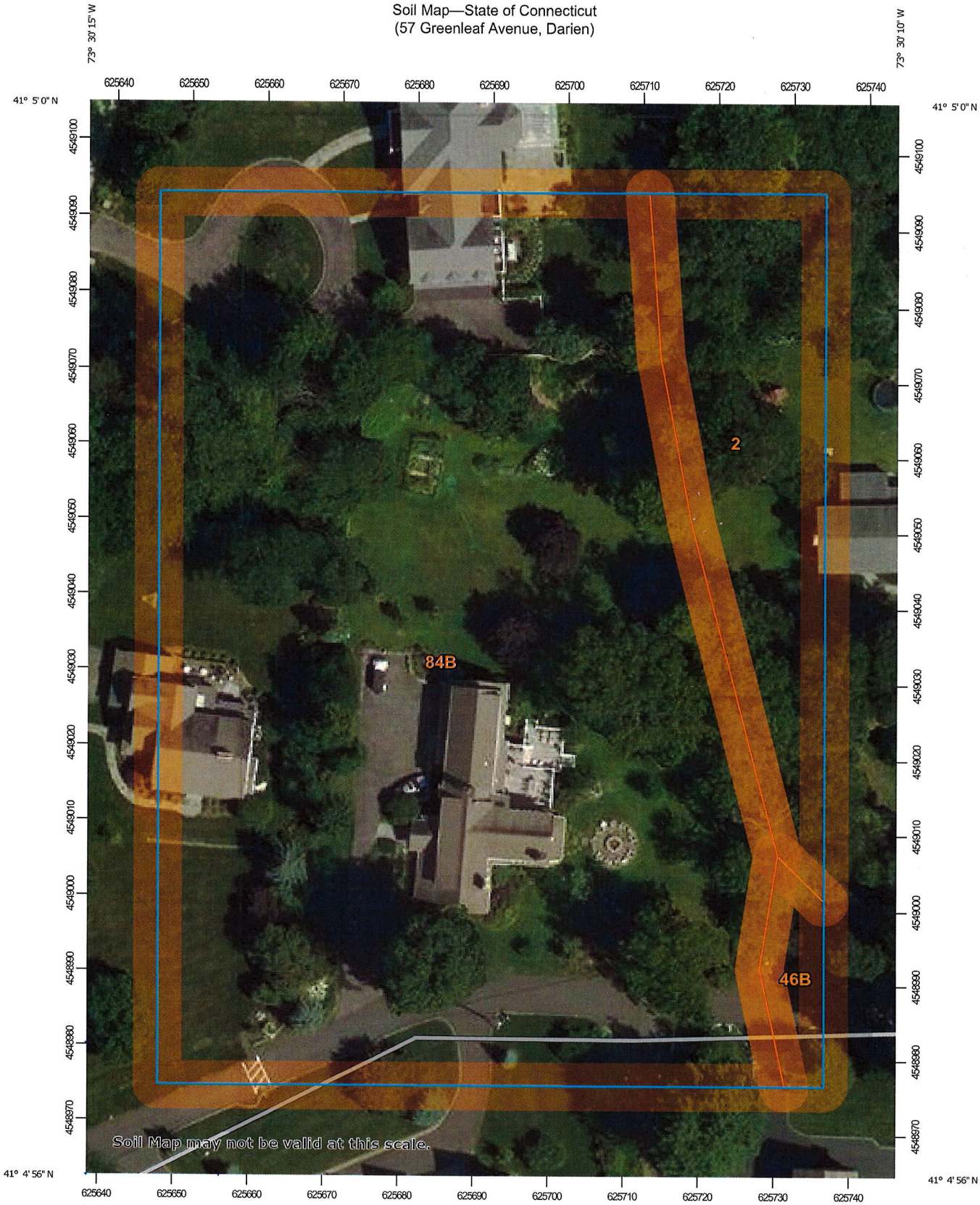
Soil Map—State of Connecticut
(57 Greenleaf Avenue, Darien)



Map Scale: 1:694 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	0.4	14.0%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	0.0	1.9%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	2.2	84.1%
Totals for Area of Interest		**2.6**	**100.0%**

State of Connecticut

84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qn
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 55 percent
Montauk and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Montauk

Setting

Landform: Drumlins, hills
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

A - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 14 inches: fine sandy loam
Bw2 - 14 to 25 inches: sandy loam
2Cd1 - 25 to 39 inches: gravelly loamy coarse sand
2Cd2 - 39 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Ridgebury

Percent of map unit: 5 percent
Landform: Hills, ground moraines, depressions, drainageways
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Woodbridge

Percent of map unit: 5 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 20, Jun 9, 2020